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# CANADA

## THE PATENT OFFICE

PATENT No. 505,307 ISSUED AUG. 24, 1954

### Retaining Device

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Application August 30, 1950, Serial No. 605,113

4 Claims

This invention relates to a retaining device, and more particularly to an automatic repeater locking device applicable to different appliances and particularly those comprising opening lids or covers.

The device of this invention comprises a fixed member and a movable member with mutual connecting means so as to become locked in a given point thereof, but having releasing means responsive to a push action in the same direction of closure, whereby it may be termed a repeater self-operating mechanism not requiring any hand operation for the locking and releasing thereof.

For this purpose, one of the locking parts comprises a locking pin slidable in a cardioid-shaped guideway corresponding to the other locking part, said guideway being provided with an inlet and outlet opening, and with an inlet branch terminating by means of an angle or bend in a retaining elbow corresponding to the locking position, and from this retaining elbow, said guideway is formed with a further bend corresponding to the return branch towards said inlet and outlet opening. Inasmuch as the entire course of the guideway is provided with edges of incidence so that the pin will be guided progressively through the circuit, the path to the locking point will always be through the inlet branch to the elbow constituting the locking position, whereas the release path will be through the return branch to the same inlet and outlet opening.

Apart from the above, the invention contemplates various objects, among which may be cited that of providing a solid lock without danger of accidental release, since the locking point is formed at the reentrant apex of a steep angle.

A further object is to render practical the handling of movable lids or covers in locking same in open position, as the user will only have to move the lid or cover without paying any attention to the lock, since the latter will stop automatically upon the pin engaging the cardioid. The release of the lock is obtained in a manner equally easy, since a slight push will release the pin.

A further object of the invention is to provide a lock which will be inexpensive, while at the same time efficient and safe in operation.

Other objects and advantages of the invention will become apparent in the course of the following description, when read in conjunction with the accompanying drawings illustrating by way of example a preferred embodiment of the invention. In the drawings:

Fig. 1 is a view of the device in released position, showing the two simple main elements

thereof, i.e., the stem with a pin and the cardioid guideway.

Fig. 2 is a view showing the pin entering the cardioid guideway in the direction of the final locking elbow or bend.

Fig. 3 is a view of the device in locking position showing by means of arrows the manner in which, after reaching the deepest bend, the pin will slide towards the locking angle due to its own weight.

Fig. 4 graphically shows the manner in which the pin is deflected towards a bend directed to the outlet upon exerting a slight push on the movable part.

Fig. 5 shows graphically the movable part being withdrawn due to the fact that the pin is in the outgoing path of the cardioid guideway and

Fig. 6 is a view of the device as applied to an automobile hood, which is shown locked in open position by means of said device.

The same reference characters are used to indicate like or corresponding parts or elements throughout the drawings.

As shown in the drawings, the reference character a indicates a cardioid guideway formed by a slot or groove formed in a part 1 which is preferably fixed to a base b.

The cardioid guideway a is provided with an inlet and outlet opening 2 having a directing angle for receiving a pin 3 provided with a small sliding roller 3'. Said opening 2 is displaced relative to the apex 4 of a central portion 5 forming the inner edges of the guideway a.

Due to this displacement of the inlet 2 with respect to the apex 4, upon inserting the pin 3, the latter will strike the edge of incidence 6, remaining in the inlet branch 7 which is the advance path branch and comprises at the ends thereof a bend a' formed by an incidence or striking edge 8 and a re-entrant apex 9 which is displaced with respect to the projecting apex 10 in the central portion 5. Therefore, after having engaged the apex 9, if the pressure exerted on the movable part c corresponding to the pin 3 is released, instead of returning by the inlet branch 7, the pin 3 will strike against the edge 11 of the central portion 5, which as a line of incidence terminates in an elbow 12 wherein the pin 3 will be retained. Thus, the elbow 12 is the retaining means proper, since it will determine the locking position shown in Fig. 3.

As shown in the drawings, the elbow 12 is displaced beyond the line corresponding to the projecting apex 13, whereby when in the position shown in Fig. 3, if the pin 3 is again pushed it

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As shown in the drawings, the elbow 12 is displaced beyond the line corresponding to the projecting apex 13, whereby when in the position shown in Fig. 3, if the pin 3 is again pushed it will strike the edge of incidence 14 and be directed towards the re-entrant apex 15, as shown in Fig. 4. Said apex 15 forming a bend a'' is displaced with respect to the apex 16 of the central portion 5, and therefore if the pin 3 is released, it will move by the return branch 17 to the opening 2 through which it can freely leave the guideway.

The pin 3 carrying its roller 3' is preferably mounted

on a stem 18 pivoted by means of a pivot pin 19 to a support 20 of the movable part c which may be the lid of a box or trunk or an automobile hood as shown in Fig. 6.

The stem 18 is pressed by two opposing springs 21 the tension of which is equivalent, whereby they will hold the stem 18 in normal position with respect to the part c. Thus, the stem 18 will tend to assume a given position, but will yield on being guided along the guideway a.

In view of this arrangement of the stem 18 constituting a support for the pin 3, the person operating the lid or movable part c will not have to take any steps to get the pin 3 to enter the cardioid guideway a when it reaches the point of maximum opening, as said pin will enter through the inlet by itself.

Summarizing, with the part or cover removed from the locking position, upon being raised so as to open same the stem 18 will be directed towards the inlet 2, the pin 3 engaging the cardioid guideway a. Sliding by means of the small roller 3' thereof, said pin 3 will reach the bend a', or more specifically the re-entrant apex 9, and upon releasing the cover it will then be directed towards the elbow 12, as shown in Fig. 3, where it will stop.

In order to close the cover, it will be sufficient to push same enough to cause the pin 3 to reach the bend a'' (see Fig. 4) as from the apex 15 thereof the pin will engage the return branch 17 (Fig. 5) leaving through the same opening 2.

Instead of having the pin 3 on the movable part of the device, the arrangement may be reversed, i.e., the part 1 having the cardioid guideway may be movable.

It is evident that in carrying out this invention, several modifications, changes and/or alterations will occur to those skilled in the art, without departing from the scope of the invention as clearly set forth in the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

- 1.- A retaining device, which comprises on one of the parts to be connected, a locking pin movable in the path of a cardioid guideway corresponding to the other part to be connected, said guideway having an inlet and outlet opening with an inlet branch terminating by means of a bend in a retaining elbow corresponding to a locking position, and  
10 from said retaining elbow said guideway includes a further bend corresponding to a return branch directed towards said inlet and outlet opening, the entire guideway having a plurality of striking edges capable of guiding said pin in both its progressive inward and return movements.
- 2.- A retaining device, which comprises on one of the parts to be connected, a pivoted stem provided with tension means holding the free end thereof aligned with the inlet of a cardioid guideway corresponding to the opposite part to  
20 be connected, said free end of said stem having a locking pin slidable in said cardioid guideway, the latter including, following the inlet thereof, an inlet branch terminating by means of a bend in a retaining elbow corresponding to a locking position, and from said retaining elbow said guideway includes a further bend corresponding to a return branch directed towards said inlet and outlet opening, the entire guideway having a plurality of striking edges capable of guiding said pin in both its progressive inward and return movements.
- 3.- A retaining device, which comprises on one of the parts  
30 to be connected, a locking pin movable in the path of a cardioid guideway corresponding to the other part to be connected, said guideway having an inlet and outlet opening normally directed towards an inlet branch forming a bend provided with a re-entrant apex opposite a striking

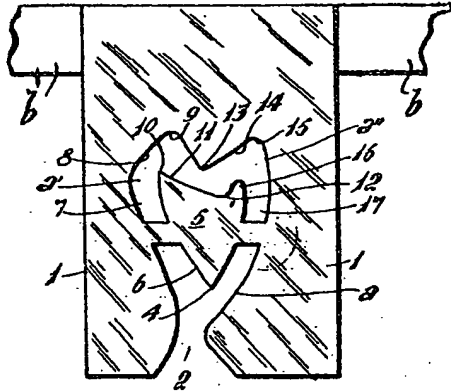
edge leading towards a retaining elbow, the latter having opposite thereto a striking edge leading towards a return branch ending at said inlet and outlet opening.

- 4.- A retaining device, which comprises on one of the parts to be connected, a locking pin provided with a small roller and slidable in the path of a cardioid guideway corresponding to the other part to be connected, said guideway having an inlet and outlet opening including an angular enlargement corresponding with the normal position of said pin
- 10 which is mounted at the end of a movable stem, said opening being aligned with a striking edge leading towards an inlet branch forming a bend leading towards a retaining elbow corresponding to a locking position, said retaining elbow having opposite thereto a striking edge leading towards a return branch ending at said inlet and outlet opening.

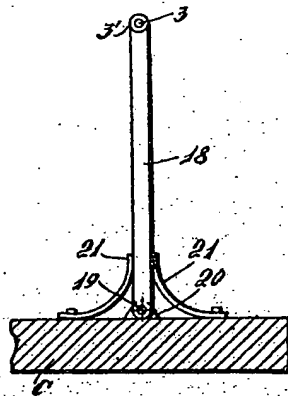


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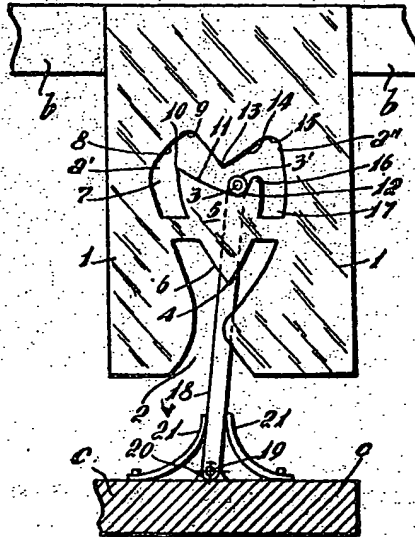
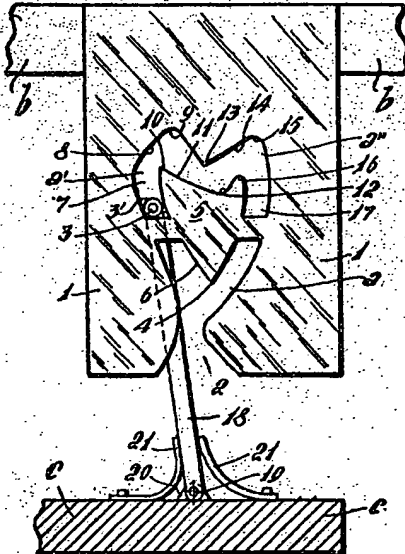
**Fig. 1**



**Fig. 2**



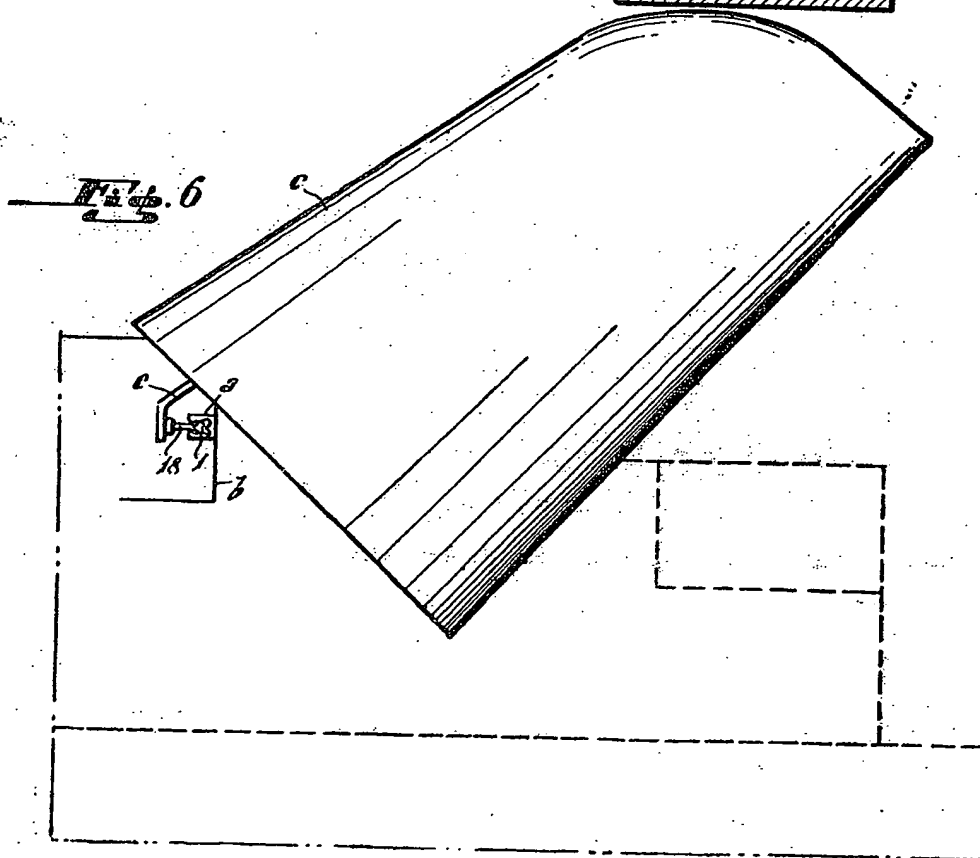
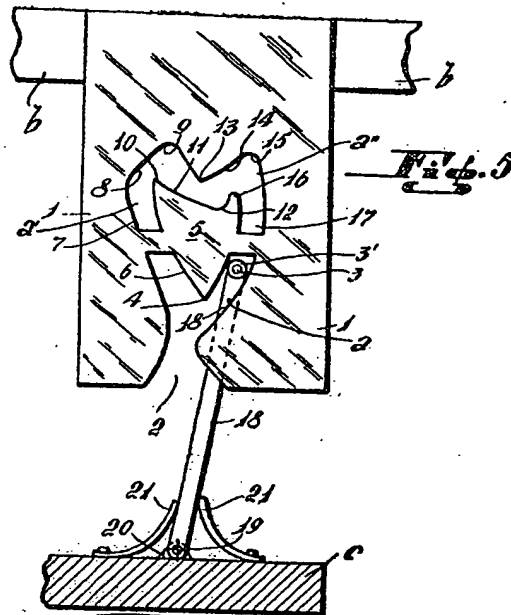
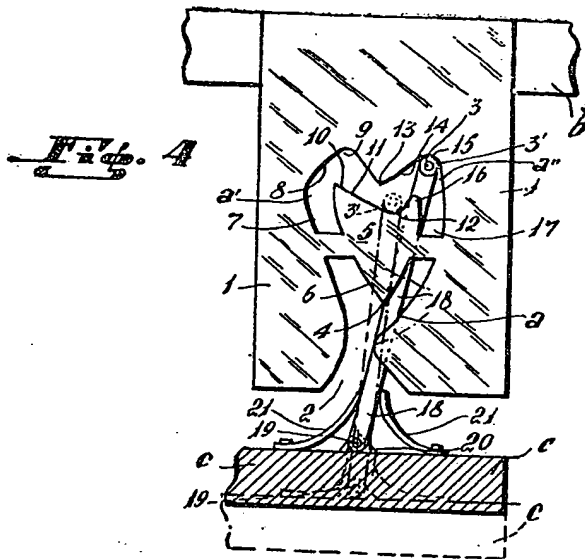
**Fig. 3**



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